CONNECTICUT COASTAL BASIN
SEYMOUR, CONNECTICUT

WIRE COMPANY DAM NO. 2
CT 00601

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS. 02154

JULY 1981

UNCLASSIFIED

URITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
EPORT NUMBER CT 00294	2. GOVT ACCESSION NO. AD-A044 965	3. RECIPIENT'S CATALOG NUMBER
ITLE (and Subtitle) Woodtick Reservoir Dam TIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL MS		5. TYPE OF REPORT & PERIOD COVERED INSPECTION REPORT 6. PERFORMING ORG. REPORT NUMBER
UTHOR(s) S. ARMY CORPS OF ENGINEERS W ENGLAND DIVISION		8. CONTRACT OR GRANT NUMBER(s)
ERFORMING ORGANIZATION NAME AND ADDRESS		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
CONTROLLING OFFICE NAME AND ADDRESS PT. OF THE ARMY, CORPS OF ENGINEERS W ENGLAND DIVISION, NEDED 4 TRAPELO ROAD, WALTHAM, MA. 02254		12. REPORT DATE December 1978 13. NUMBER OF PAGES 50
MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)		15. SECURITY CLASS. (of this report) UNCLASSIFIED 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

DISTRIBUTION STATEMENT (of this Report)

PROVAL FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED

DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

SUPPLEMENTARY NOTES

ver program reads: Phase I Inspection Report, National Dam Inspection Program; wever, the official title of the program is: National Program for Inspection of n-Federal Dams; use cover date for date of report.

KEY WORDS (Continue on reverse side if necessary and identify by block number)

AMS, INSPECTION, DAM SAFETY,
ousatonic River Basin
olcott, Connecticut

ABSTRACT (Continue on reverse side if necessary and identify by block number)

he Woodtick Reservoir Dam is a cyclopean masonry concrete gravity structure that s 282 ft. long and 55 ft. high with a 100 ft. wide spillway. Based on the visual nspection, past operational performance and hydraulic computations, the dam s judged to be in fair condition. The drainage area contributing to the dam is .57 square miles. The routed test flood peak outflow is 12,670 cfs which would vertop the dam by 3.1 ft.

FORM 1473 EDITION OF 1 NOV 65 IS OBSOLETE
JAN 73

WIRE COMPANY DAM NO. 2

CT 00601

CONNECTICUT COASTAL BASIN

SEYMOUR, CONNECTICUT

PHASE I INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM

NATIONAL DAM INSPECTION PROGRAM
PHASE I INSPECTION REPORT

IDENTIFICATION NO: CT-00601

NAME OF DAM: Wire Company Dam #2

TOWN: Seymour

COUNTY AND STATE: New Haven County, Connecticut

STREAM: Little River

DATE OF INSPECTION: June 2, 1981

BRIEF ASSESSMENT

Wire Company Dam #2 consists of a stone masonry and concrete embankment, 75 ft. long, with a top width of 4 ft. at the spillway section and 1.3 ft. at the side wall, and a maximum height of 19 ft. The spillway section which is a part of the dam, is 57 ft. long.

Based on visual inspection, the Wire Company Dam #2 is judged to be in good condition. However, several areas require repair work and/or monitoring./ Some features found existing that could affect the stability of the dam are: deterioration of intake chamber structure; erosion at the low area beyond the south end of the dam; development of vegetation and trees near the east face of the intake chamber; and inadequate spillway capacity.

As per the Corps of Engineers' Recommended Guidelines for Safety Inspection of Dams, the Wire Company Dam #2 is classified as 'small' in size with 'low' hazard potential. A test flood equal to 1/2 PMF was selected in accordance with the Corps of Engineers' Guidelines. The calculated test flood

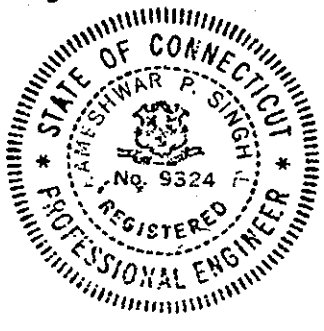
inflow of 5200 cfs which includes 860 cfs overflow from Swan Lake, results in a routed outflow of 5200 cfs (surcharge storage effect is almost negligible). With the water level at the top of the dam, the maximum spillway capacity is 1800 cfs which is 37% of the routed test flood outflow. The storage capacity of the reservoir at the top of the dam is 35 ac. ft.

It is recommended that the owner undertake and complete the remedial measures detailed in section 7. A formal program of operation and maintenance procedures should be prepared and fully documented to provide accurate records for future reference.

GOODKIND & O'DEA, INC.
AND
SINGHAL ASSOCIATES
(J.V.)

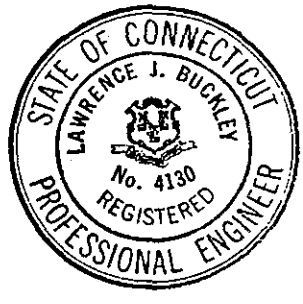
R. N. Singhal

Ramesh Singhal, Ph.D., P.E.
(Singhal Associates)



Lawrence J. Buckley

Lawrence J. Buckley, P.E.
(Goodkind & O'Dea, Inc.)



PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation: however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the

present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there by any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

The Phase I Investigation does not include an assessment of the need for fences, gates, no-trespassing signs, repairs to existing fences and railings and other items which may be needed to minimize trespass and provide greater security for the facility and safety to the pulic. An evaluation of the project for compliance with OSHA rules and regulations is also excluded.

TABLE OF CONTENTS

SECTION	PAGE NO.
LETTER OF TRANSMITTAL	
BRIEF ASSESSMENT	
REVIEW BOARD PAGE	
PREFACE	*i*
TABLE OF CONTENTS	*iii*
OVERVIEW PHOTO	Sheet 1
LOCATION PLAN	Sheet 2

REPORT

1.	PROJECT INFORMATION	1-1
1.1	General	1-1
	a. Authority	
	b. Purpose of Inspection	
1.2	Description of Project	1-2
	a. Location	
	b. Description of Dam & Appurtenances	
	c. Size Classification	
	d. Hazard Classification	
	e. Ownership	
	f. Operator	
	g. Purpose of Dam	
	h. Design & Construction History	
	i. Normal Operational Procedure	
1.3	Pertinent Data	1-4
	a. Drainage Area	
	b. Discharge at Damsite	
	c. Elevation	
	d. Reservoir Length	
	e. Storage	
	f. Reservoir Surface	
	g. Dam	
	h. Diversion & Regulating Tunnel	
	i. Spillway	
	j. Regulating Outlets	

SECTION		PAGE NO.
2.	ENGINEERING DATA	
	2.1 Design Data	2-1
	2.2 Construction Data	2-1
	2.3 Operation Data	2-1
	2.4 Evaluation of Data a. Availability b. Adequacy c. Validity	2-1
3.	VISUAL INSPECTION	
	3.1 Findings a. General b. Dam c. Appurtenant Structures d. Reservoir Area e. Downstream Channel	3-1
	3.2 Evaluation	3-5
4.	OPERATIONAL & MAINTENANCE PROCEDURES	
	4.1 Operational Procedures a. General b. Description of any Warning System in Effect	4-1
	4.2 Maintenance Procedures a. General b. Operating Facilities	4-1
	4.3 Evaluation	4-2
5.	EVALUATION OF HYDRAULIC/HYDROLOGIC FEATURES	
	5.1 General	5-1
	5.2 Design Data	5-1
	5.3 Experience Data	5-1
	5.4 Test Flood Analysis	5-1
	5.5 Dam Failure Analysis	5-2

SECTION		PAGE NO.
6.	EVALUATION OF STRUCTURAL STABILITY	
6.1	Visual Observation	6-1
6.2	Design & Construction Data	6-1
6.3	Post-Construction Changes	6-2
6.4	Seismic Stability	6-2
7.	ASSESSMENT & REMEDIAL MEASURES	
7.1	Project Assessment	7-1
	a. Condition	
	b. Adequacy of Information	
	c. Urgency	
7.2	Remedial Measures	
	a. Operation & Maintenance Procedures	7-1

APPENDICES

APPENDIX A:	INSPECTION CHECKLISTS	A-1 to A-5
APPENDIX B:	ENGINEERING DATA	
	Engineering Data Checklist	B-1
	General Plan	Sheet B-1
	Profile of Spillway	Sheet B-2
	Bibliography	B-2
APPENDIX C:	DETAIL PHOTOGRAPHS	
	Photo Location Plan	Sheet C-1
	Photographs	C-1 to C-3
APPENDIX D:	HYDROLOGIC AND HYDRAULIC COMPUTATIONS	
	Drainage Area Map	Sheet D-1
	Computations	D-1 to D-10
APPENDIX E:	INFORMATION AS CONTAINED IN NATIONAL INVENTORY	

NOTE:
OVERVIEW PHOTO TAKEN JUNE 2, 1981.

GOODKIND & O'DEA INC.—SINGHAL ASSOCIATES(J.V.) ENGINEERS	U.S. ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

OVERVIEW PHOTO OF DAM

WIRE COMPANY DAM N°. 2

SEYMOUR, CONNECTICUT

DRAWN BY	CHECKED BY	APPROVED BY	SCALE: NONE	
E.T.K.	W.J.W.	L.J.B.	DATE: JULY, 1981	SHEET 1

NATIONAL DAM INSPECTION PROGRAM
PHASE I INSPECTION REPORT

PROJECT INFORMATION
SECTION I

1.1 GENERAL

a. Authority

Public Law 92-367, August 8, 1972, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a National Program of Dam Inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. Goodkind & O'Dea Inc., Hamden, Connecticut and Singhal Associates, Orange, Connecticut (Joint Venture) have been retained by the New England Division to inspect and report on selected dams in the State of Connecticut. Authorization and notice to proceed were issued to Goodkind & O'Dea Inc. and Singhal Associates (J.V.) under a letter of June 22, 1981 from Colonel William E. Hodgson Jr., Corps of Engineers. Contract No. DACW 33-81-C-0022 dated December 9, 1980 has been assigned by the Corps of Engineers for this work.

b. Purpose of Inspection

The purposes of the program are to:

1. Perform technical inspection and evaluation of non-federal dams to identify conditions requiring correction in a timely manner by non-federal interest.

2. Encourage and prepare the States to quickly initiate effective dam inspection programs for non-federal dams.

3. To update, verify and complete the National Inventory of Dams.

1.2 DESCRIPTION OF PROJECT

a. Location

Wire Company Dam #2 is situated on Little River, in the watershed of the Naugatuck River. The confluence with the latter is 700 ft. downstream. Location of the project is approximately 2000 ft. northwest of Seymour Town Hall and 1200 ft. west of Route 8 and Route 67 interchange (Bank Street Exit #21). The geographic location of the site may be found of the Naugatuck Quadrangle Map, having coordinates of latitude N41°-23.9' and longitude W73°-04.7'.

b. Description of Dam and Appurtenant Structures

The main impoundment is located 2500 ft. upstream from the project site and connected through the Little River. The dam is a stone masonry concrete covered structure founded on ledge rock. Its total length is approximately 75 ft. including a 57 ft. wide spillway section with crest elevation 129.5'. (All elevations in the report are referenced to Mean Sea Level). Located at the South end of the project, the concrete wall dam section is 1.3 ft. wide and at a crest elevation of 134.3'. The downstream face of the spillway structure has a slope of 1 horizontal to 6 vertical, and a crest width of 4 ft.

Abutting the south end of the spillway is a concrete intake chamber having two gates with rusted winch mechanisms.

A 36 inch dia. iron pipe extends from the intake chamber to a gutted turbine chamber and outlets into the downstream channel.

c. Size Classification: 'Small'

According to the Corps of Engineers' Recommended Guidelines for Safety Inspection of Dams, a dam is classified 'Small' if either its height is between 25 ft. and 40 ft. or the storage volume is between 50 and 1000 ac. ft. The Wire Company Dam #2 has a maximum impoundment of 34 ac. ft. and a maximum height of 19 ft. As such it is classified as 'small' in size.

d. Hazard Classification: 'Low'

Based on the Corps of Engineers Recommended Guidelines for Safety Inspection of Dams, the hazard classification for Wire Co. Dam #2 is 'low'. A dam failure analysis indicates that a breach of the dam would result in a downstream flood flow of approximately 4200 cfs causing a 7 ft. high wave of water to travel down the Little River. The wave height reduces to about 6.5 ft. at the second cross-section located 200 ft. upstream of the confluence of Little River and Naugatuck River.

The analysis shows that there is no flood hazard either under the test flood condition or the dam failure condition. There is no likelihood of loss of lives or flooding of residential houses, but there may be some economic loss. The dam is therefore classified as 'low' hazard potential.

e. Ownership

The Wire Co. Dam #2 is owned by:

Housatonic Wire Company Inc.
109 River Street
Seymour, Connecticut
Telephone: (203) 888-9670

f. Operator

Housatonic Wire Company Inc.
109 River Street
Seymour, Connecticut
Telephone: (203) 888-9670

g. Purpose of Dam

Power generation.

h. Design and Construction History

No design or construction records of the project are available; however, it was learned through informal conversations with local residents that the dam was constructed in the early 1900's. Originally a stone masonry structure, it was covered with concrete some 40 or 50 years back.

i. Normal Operational Procedures

At this time, there are no maintenance or operational procedures for the facilities.

13. PERTINENT DATA

a. Drainage Area

The drainage area consists of 14.6 sq. miles of moderately sloping terrain, with an average slope of approximately 2% and elevations ranging from 130 to 900 MSL. The major portion of the area is developed and has several town roads and State Route 67 passing through. In addition to the runoff from this drainage area, the impoundment receives a 860 cfs overflow from the Swan Lake Dam.

b. Discharge at Damsite

Discharge from the reservoir passes down a spillway into the Little River and 2500 ft. downstream flows over the 57 ft. long

spillway at the Wire Co. Dam #2. For higher flows, the dam itself along with a low area on the south side acts as an overflow section.

1.	Outlet works (conduits) size	1-36" iron pipe
	Low level inlet invert elevation	123.4
	Discharge capacity at test flood elevation:	100 cfs 137.0
2.	Maximum known flood at damsite:	Unknown
3.	Ungated spillway capacity at top of dam: elevation:	1800 cfs. 134.3
4.	Ungated spillway capacity at test flood elevation: elevation:	5200 137.0
5.	Gated spillway capacity at Normal pool elevation:	N/A
6.	Gated spillway capacity at test flood elevation:	N/A
7.	Total spillway capacity at test flood elevation: elevation:	5200 cfs 137.0
8.	Total project discharge at top of dam: elevation:	1800 cfs 134.3
9.	Total project discharge at test flood elevation: elevation:	5200 cfs 137.0

c. Elevation (NGVD)

1.	Streambed at toe of dam:	98.4
2.	Bottom of Cutoff:	N/A
3.	Maximum tailwater:	N/A
4.	Recreation Pool:	N/A
5.	Full flood control pool:	129.5
6.	Spillway crest:	129.5
7.	Design surcharge - original design:	N/A
8.	Top of dam:	134.3

9.	Test flood surcharge:	137.0

d. Reservoir - Length in feet

1.	Normal pool:	5000
2.	Flood control pool:	5000
3.	Spillway crest pool:	5000
4.	Top of Dam:	5000
5.	Test flood pool:	5000

e. Storage - Acre Feet

1.	Normal pool:	34
2.	Flood control pool:	34
3.	Spillway crest pool:	34
4.	Top of dam:	35
5.	Test flood pool:	37

f. Reservoir Surface-Acres

1.	Normal pool:	8.6
2.	Flood control pool:	8.6
3.	Spillway crest pool:	8.6
4.	Top of dam:	8.7
5.	Test flood pool:	9.0

g. Dam

1.	Type:	Stone masonry and concrete
2.	Length:	75 ft.
3.	Height:	19 ft.
4.	Top width:	Spillway: 4 ft. Concrete Wall: 1.3 ft.
5.	Side Slopes:	U/S slope: N/A D/S slope: 1 horizontal to 6 vertical
6.	Zoning:	N/A

7.	Impervious core:	N/A
8.	Cutoff:	N/A
9.	Grout curtain:	N/A
10.	Other:	-

h. Diversion and Regulating Tunnel — N/A

i. Spillway

1.	Type:	Stone masonry and concrete
2.	Length of crest:	57 ft.
3.	Crest elevation:	129.5
4.	Gates:	None
5.	Upstream channel:	Little River
6.	Downstream channel:	Little River
7.	General:	--

j. Regulating Outlets

One - 36" pipe low level outlet

ENGINEERING DATA
Section 2

2.1 Design Data

Data pertinent to the design of the dam are not available.

2.2 Construction Data

Records of the construction of the project are not available.

2.3 Operational Data

Data concerning the operations of the dam could not be obtained.

2.4 Evaluation of Data

a. Availability

There are no known available engineering data.

b. Adequacy

No engineering data are available to be of any assistance in the evaluation of the project.

c. Validity

Due to the absence of any engineering data, the validity of the data cannot be assessed.

VISUAL INSPECTION
Section 3

3.1 Findings

a. General

Engineers from Goodkind & O'Dea, Inc. and Singhal Associates performed a formal inspection of Wire Company Dam No. 2 on June 2, 1981. Detailed checklist included in Appendix A aided in the inspection of the project. In addition, photographs of the dam and appurtenances and the problem areas were taken and are given in Appendix C with the photo location plan.

Based upon the visual inspection, the general condition of the project was good with no evidence of instability. At the time of the inspection there was a light rainfall with the upstream pool level two-tenths of a foot above the spillway crest.

b. Dam

Wire Company Dam No. 2 is primarily a stone masonry concrete covered structure founded on rock ledge. Outlet works are situated at the south end of the project with an overflow weir across the dam section. A concrete retaining wall is located on the north side of the dam running parallel to Route 67 as shown on the general plan in Appendix B.

Flow over the spillway partially obscured the dam embankment which was generally in good condition with no indication of cracking (see Photos 1 and 2). Exposed aggregate was noted along the entire length of the spillway with additional deterioration at the junction of the north retaining wall and the outlet works. Inspection of the contact zone between the

concrete and rock ledge foundation revealed the possibility of undercutting; however, a close inspection of this area was hindered by the continuous spillway flow. Accumulated debris was observed on the crest and at the toe of the dam as shown in Photos 2 and 3.

The concrete structures abutting the north end of the dam appeared stable and generally were in good condition. Observations did reveal minor concrete cracking at the retaining wall as noted on the general plan in Appendix B.

Immediately south of the concrete outlet works is an additional retaining wall nine feet long. Serving as part of the dam embankment, this concrete structure was in good condition with one minor crack noted. Approximately two feet lower and south of this concrete wall, a low area was observed, as shown on the general plan in Appendix B. During flood conditions, water would channel through this depression promoting erosion and possibly undermining the concrete wall and/or outlet works.

Upstream of the dam, the water depth varies from 2 to 4.5 feet which signifies that a great amount of sediment has accumulated behind the dam embankment. This build-up of material will continue and is the result of the Little River depositing sediment.

c. Appurtenant Structures

Outlet Works

Abutting the south end of the spillway and founded on the rock ledge is the concrete intake chamber which is shown in Photos 1 and 4. Two gates with rusted winch mechanisms are

located on the upstream and downstream side of this chamber as noted on the general plan in Appendix B. Although the gates were not opened, the mechanical works were intact and appeared to be operable. The steel platform and trash rack within the chamber and the pipe railing on top of this structure are rusted but appeared to be structurally sound.

As noted on the general plan in Appendix B, a 1.5 ft. wide x 2 ft. high opening, approximately 1 ft. deep was observed at the southwest corner of the chamber. It appears that a small boulder along with the mortar broke from the intake chamber, leaving a hole partially inundated with water. Deteriorated concrete was also observed along the west and the north face of this structure, probably due to the spillway flow. Exposed and broken aggregate and efflorescence were noted but there was no indication of cracking on these fascias.

Deteriorated concrete with exposed aggregate was observed along the inside wall of the intake chamber which contained water. The water level fluctuates with the upstream pool elevation resulting in a condition of varying submergence accelerating the deterioration of the concrete. Water flowing into the chamber is probably leaking through the west fascia or the upstream gate. A two inch tree which appeared to be dead was also noted inside the chamber.

As shown in Photo 1, minor leakage was observed outletting from the 18 inch opening on the north face of the chamber. No control works for this outlet were visible nor was its purpose determined. Another opening was noted on the last fascia of the intake chamber (see general plan in Appendix B). Flowing

full, water was outletting from a 3 inch opening which possibly serves as a drain for the chamber.

Photo 4 shows a large 36 inch iron pipe extending from the concrete intake structure to a gutted turbine chamber. Eventually outletting into the downstream channel, the steel plated, rivetted pipe was in fair condition. Excessive leakage of several gallons per minute was observed from the pipe at the junction with the intake chamber accelerating the deterioration of the concrete. The power generation system is presently inoperable with the turbine works removed.

Several large trees are overhanging the concrete intake chamber and steel outlet pipe as shown in Photo 1. Potentially, these trees could cause severe damage to the pipe and/or chamber which could have an adverse effect on the structural stability of the dam.

d. Reservoir Area

A reservoir 2500 ft. upstream serves as the main impoundment for Wire Company Dam #2. Several residential homes are located along this reservoir and the Little River as indicated on the Location Plan (see Sheet 2). As shown in Photo 5, a bridge carries the Route 67 traffic over the river approximately 60 feet upstream from the dam.

e. Downstream Channel (Little River)

Immediately downstream of the dam is an irregular rock ledge acting as a spillway to the downstream channel (See Photo 3). The Little River is paralleled by steep rock ledge on the north bank and a masonry wall along the south bank. As shown in Photo 6, a portion of this south wall has collapsed

just downstream of the 36" outlet pipe. Wire Company Dam No. 1, a stone masonry structure, is located approximately 200 ft. downstream of the Dam No. 2. Several abandoned houses are situated between these two dams high on the north bank.

Approximately 90 ft. apart, two bridges cross the Little River several hundred feet downstream of the dams. The first bridge is a small stone masonry arched structure whereas the adjacent bridge is much larger and consists of concrete and steel girders. The Little River flows into the Naugatuck River approximately 700 feet downstream from Dam No. 2.

3.2 Evaluation

As assessed by the visual inspection, the general condition of the project was good with several areas requiring repair and/or maintenance work. The combination dam and spillway structure appeared to be in good condition with no signs of instability whereas the outlet works were considerably more deteriorated. As previously noted, the large hole observed at the west wall of the intake chamber is semi-submerged which, thereby, accelerates the deterioration of the fascia. Leakage through this hole and/or the upstream gate has also decreased the stability of the concrete structure by promoting additional deterioration within the chamber.

Observations revealed a small low area immediately south of the dam embankment which is susceptible to channelization during high water conditions. Flows through the notch would be at relatively high velocities, encouraging erosion and the potential undermining of the south retaining wall and/or outlet works.

OPERATIONAL AND MAINTENANCE PROCEDURES
Section 4

4.1 Operational Procedures

a. General

No formal operational procedures for Wire Company Dam No. 2 exist at this time. The outlet works were last operated in the Spring of 1981 when the gates were opened approximately one inch. Once utilized for controlling water to a turbine downstream, the gates normally remain in the closed position.

b. Description of any Warning Systems in Effect

There are no emergency operation plans and, since the project is classified as a 'low' hazard potential, none are required at this time.

4.2 Maintenance Procedures

a. General

Maintenance procedures for the dam and appurtenances do not exist.. According to the present owner, no repairs have been made to the structures since the change of ownership four years ago. The owner plans to landscape the grounds in the vicinity of the dam by removing brush and shrubs and planting evergreen.

b. Operating Facilities

At this time there are no maintenance procedures for the outlet works which are operable. Plans are underway to paint the iron works and gate mechanisms at this regulating outlet.

4.3 Evaluation

Operations and maintenance of the Wire Company Dam No. 2 are fair. Procedures for the maintenance and operations of the structures should be prepared by the owner to ensure the stability of the project.

EVALUATION OF HYDRAULIC/HYDROLOGIC FEATURES
SECTION 5

5.1 GENERAL

The Wire Company Dam #2 site has a contributory drainage area of 14.6 square miles which is moderately sloping with average slope of approximately 2%. Major portion of this area is developed with several town roads and State Route 67 passing through. In addition to the runoff from this drainage area, the site receives overflow from the Swan Lake Dam.

There is a 57 ft. wide concrete spillway section with crest elevation 129.5. The maximum spillway capacity up to the top of the dam (crest elevation 134.3) is 1800 cfs. After the flood level rises over 134.3, the dam itself acts as an overflow section along with a natural depression in ground towards the south side extending to a rising hill. At the test flood flow of 5,200 cfs, the water elevation rises to 137.0'which is 2.7 ft. higher than the crest elevation of the dam.

5.2 Design Data

No design data are available.

5.3 Experience Data

The main impoundment pertaining to this dam is located approximately 2500 ft. upstream. No records are kept of reservoir water elevations.

5.4 Test Flood Analysis

Based on the dam failure analysis, the Wire Company Dam #2 is classified as 'low' hazard potential in accordance with the Corps of Engineers' Recommended Guidelines for Safety Inspection of Dams. A test flood equal to 1/2 PMF was adopted for analysis.

An inflow peak rate of runoff was calculated for 14.6 sq. miles of watershed. The average slope of the terrain being 2%, it was placed in the 'Flat and Coastal' category. A runoff factor of 600 cfs per sq. mile was used which resulted in a runoff of 8,760 cfs. The test flood was taken as half of this runoff plus an 860 cfs overflow from Swan Lake = (1/2 x 8760) +860 = 5240, say 5200 cfs.

The surcharge storage capacity at the reservoir (located 2500 ft. above the project site) being small, does not result in an appreciable decrease due to routing and the full flow 5,200 cfs was used to calculate the extent of overtopping of the dam. The spillway capacity up to the top of the dam is 1800 cfs. which is only 37% of the test flood flow. Under the test flood condition, the dam will be overtopped by 2.7 ft.

5.5 Dam Failure Analysis

A dam failure analysis was done in accordance with the Corps of Engineers' Guidelines. Failure was assumed with the water level at the top of the dam elevation 134.3. Assuming a dam breach 30 ft. wide (40% of the dam length), and 19 ft. high, the peak release rate was 4200 cfs.

Downstream flood routing computations were done taking into consideration the available valley storage. The height of the flood wave was 7 ft. at the first cross section (sta. 2+0), and approximately 6.5 ft. at the second cross section (sta. 5+00) near the confluence with the Naugatuck River. The resulting flood elevations and the values of routed flood flows are shown in Appendix D, which also gives the routed flows and flood

elevations for the test flood, assuming no failure. The two sets of flood depths are tabulated below:

	Initial Q cfs	Flow depth (ft) Sta. 2+0	Sta. 5+00
Test flood condition (no dam failure)	5200	8.3	7.0
Dam failure condition	4200	7.0	6.5

The analysis shows that there is no flood hazard under the test flood (no failure) condition. Also no additional flood hazard will be caused by dam failure. There is no likelihood of loss of lives or flooding of residential houses. There may be some economic loss. The dam is therefore classified as 'low' hazard potential.

EVALUATION OF STRUCTURAL STABILITY
Section 6

6.1 Visual Observations

As assessed by the visual inspection, no structural stability problems were revealed at Wire Company Dam No. 2; however, several areas of concern were noted.

The opening observed at the west face of the concrete intake chamber is susceptible to additional deterioration. Partially inundated with water, the hole will continue to enlarge, greatly diminishing the stability of the structure. Although the chamber is part of the outlet works, this west fascia also retains water acting as a section of the dam.

Several large trees are located in the vicinity of the outlet works. A falling tree could severely damage the intake chamber and the 36" iron pipe. Potentially, the pipe could be torn from the intake chamber adversely affecting the condition of the structure and downstream gate.

A considerable quantity of sediment has accumulated behind the dam with the average upstream depths varying from 2 to 4.5 feet. Such a condition puts additional strain on the dam embankment.

6.2 Design and Construction Data

Due to the unavailability of design and construction data, an in-depth analysis of the structural stability could not be undertaken at this time.

6.3 Post Construction Changes

Records of post construction changes are not available; however, through an informal conversation with a local resident, it was learned that the project was originally a stone masonry structure. At some unknown date, perhaps forty or fifty years ago, concrete was placed over the stone masonry embankment forming the existing structure. In addition, repairs were made to the intake chamber of the outlet works.

6.4 Seismic Stability

The dam is located in Seismic Zone 1 and, in accordance with Corps of Engineers' guidelines, does not warrant further seismic analysis at this time.

ASSESSMENT AND REMEDIAL MEASURES
Section 7

7.1 Project Assessment

a. Condition

As assessed by the visual inspection of the site and past performance, the project appears to be in good condition. No evidence of structural instability was observed but there were areas of concern requiring maintenance, repair work and/or monitoring as noted in Section 7.2.

Based upon "Preliminary Guidance for Estimating Maximum Probable Discharge" dated March, 1978, peak inflow to the reservoir is 5200 cfs; peak outflow is 5200 cfs, with the water level 2.7 ft. above the top of dam. With the upstream pool level to the crest of the dam, the spillway capacity is 1800 cfs, which is approximately 37% of the routed test flood outflow.

b. Adequacy of Information

The information available is such that an assessment of the condition and stability of the project is to be based primarily on the visual inspection.

c. Urgency

It is recommended that the measures presented in Section 7.2 be implemented within two years of the owner's receipt of this report.

7.2 Remedial Measures

a. Operation and Maintenance Procedures

The following measures should be undertaken within the time period indicated in Section 7.1.c, and continued on a

regular basis.

1. Prepare a formal program of operational and maintenance procedures and fully document to provide accurate records for future reference.
2. Repair the hole and the areas of concrete deterioration at the intake chamber.
3. Fill in low area immediately south of the dam embankment to the level of the concrete wall and provide for adequate protection against erosion.
4. Remove trees within 25 feet of the east face of the intake chamber.
5. Remove brush and debris on crest of the spillway.

APPENDIX A

INSPECTION CHECKLIST

VISUAL INSPECTION CHECK LIST
PARTY ORGANIZATION

PROJECT Wire Company Dam #2

DATE 6/2/81

TIME Morning

WEATHER 60's rainy

W.S. ELEV. 129.7 MSL U.S. 99.5 MSL DN.S.

PARTY:

		DISCIPLINE:
1. Wesley J Wolf	(WW)	Hydraulics & Survey
2. Larry J. Buckley	(LB)	Geotechnical
3. Ramesh Singhal	(RS)	Hydraulics
4. Gerald F. Buckley	(GB)	Soils & Structures
5. Glenn Scallio	(GS)	Structures

PROJECT FEATURE	INSPECTED BY
1. Dam Embankment	WW, LB, RS, GB, GS
2. Spillway	WW, LB, RS, GB, GS
3. Outlet Works - Intake	WW, LB, RS, GB, GS
4. Outlet Works - Outlet	WW, LB, RS, GB, GS
5.	
6.	
7.	
8.	
9.	
10.	

PERIODIC INSPECTION CHECK LIST

PROJECT Wire Company Dam #2 DATE 6/2/81

PROJECT FEATURE Dam Embankment NAME WW, LB, RS, GB, GS

DISCIPLINE : NAME

AREA ELEVATED	CONDITIONS
DAM EMBANKMENT	Concrete Embankment on Rock Ledge.
Crest Elevation	134.3' (MSL)
Current Pool Elevation	129.7' (MSL)
Maximum Impoundment to Date	Unknown
Surface Cracks	Minor Cracks at South Concrete Embankment
Pavement Conditions	N/A
Movement or settlement of crest	None Observed
Lateral movement	None Observed
Vertical alignment	Looks Good
Horizontal alignment	Looks Good
Conditions at abutment & at Concrete Structures	Low area between Southend of dam & dirt pile.
Indications of Movement of Structural Items on Slopes	None
Trespassing on Slopes	Minor - Pedestrian Only
Sloughing or Erosion of Slopes or Abutments	None
Rock Slope Protection-Riprap Failures	N/A
Unusual Movement or Cracking at or Near Toes	None Observed
Unusual Embankment or Downstream Seepage	None Observed - Water Flowing or Spillway
Piping or Boils	None
Foundation Drainage Features	N/A
Toe Drains	N/A
Instrumentation System	N/A

PERIODIC INSPECTION CHECK LIST

PROJECT Wire Company Dam #2 DATE 6/2/81

PROJECT FEATURE Concrete Spillway NAME WW, LB, RS, GB, GS

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS	
a. Approach Channel	Little River
General Condition	Good
Loose rock overhanging channel	None
Trees Overhanging Channel	Few small Trees
Floor of Approach Channel	Dirt Floor - O.K.
b. Weir ~~and trailing walls~~	Concrete Spillway; No Training walls
General Condition of Concrete	None
Rust or Staining	None Observed; Aggregate exposed due to water flow.
Spalling	None } Flow over Spillway
Any Visible Reinforcing	None
Any Seepage or Efflorescence	N/A
Drain Holes	
c. Discharge Channel	Little River - Rock Ledge
General Condition	Good
Loose Rock Overhanging Channel	Large Rock Ledges overhanging both banks. appeared stable
Trees Overhanging Channel	Numerous large trees on both sid
Floor of Channel	Rock Bottom - Good Conditi
Other Obstructions	Accumulation of brush & debris on concrete weir & in discharge channel

PERIODIC INSPECTION CHECK LIST

PROJECT Wire Company Dam #2 DATE 6/2/81

PROJECT FEATURE Intake Works NAME WW, LB, RS, GB, GS

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE	9'x 12' Concrete Intake Chamber with two gates. Little River
a. Approach Channel	O.K.
Slope Conditions	O.K.
Bottom Conditions	None
Rock Slides or Falls	N/A
Log Boom	None
Debris	N/A
Condition of concrete lining	N/A
Drains or Weep Holes	
b. Intake Structure	Large hole on West Face of structure. Concrete deteriorated at NE corner & inside structure. Evidence of efflorescence on east face of structure. Two inch tree growing inside structure - appears dead. Iron winches were rusty but were somewhat operable. Minor Leakage from 18" outlet on North Face Water flowing full from 3" Pipe on east face
Condition of Concrete	
~~Stop Logs and Slots~~	

PERIODIC INSPECTION CHECK LIST

PROJECT Wire Company Dam #2 DATE 6/2/81

PROJECT FEATURE Outlet Works NAME WW, LB, RS, GB, GS

DISCIPLINE _____ NAME _____

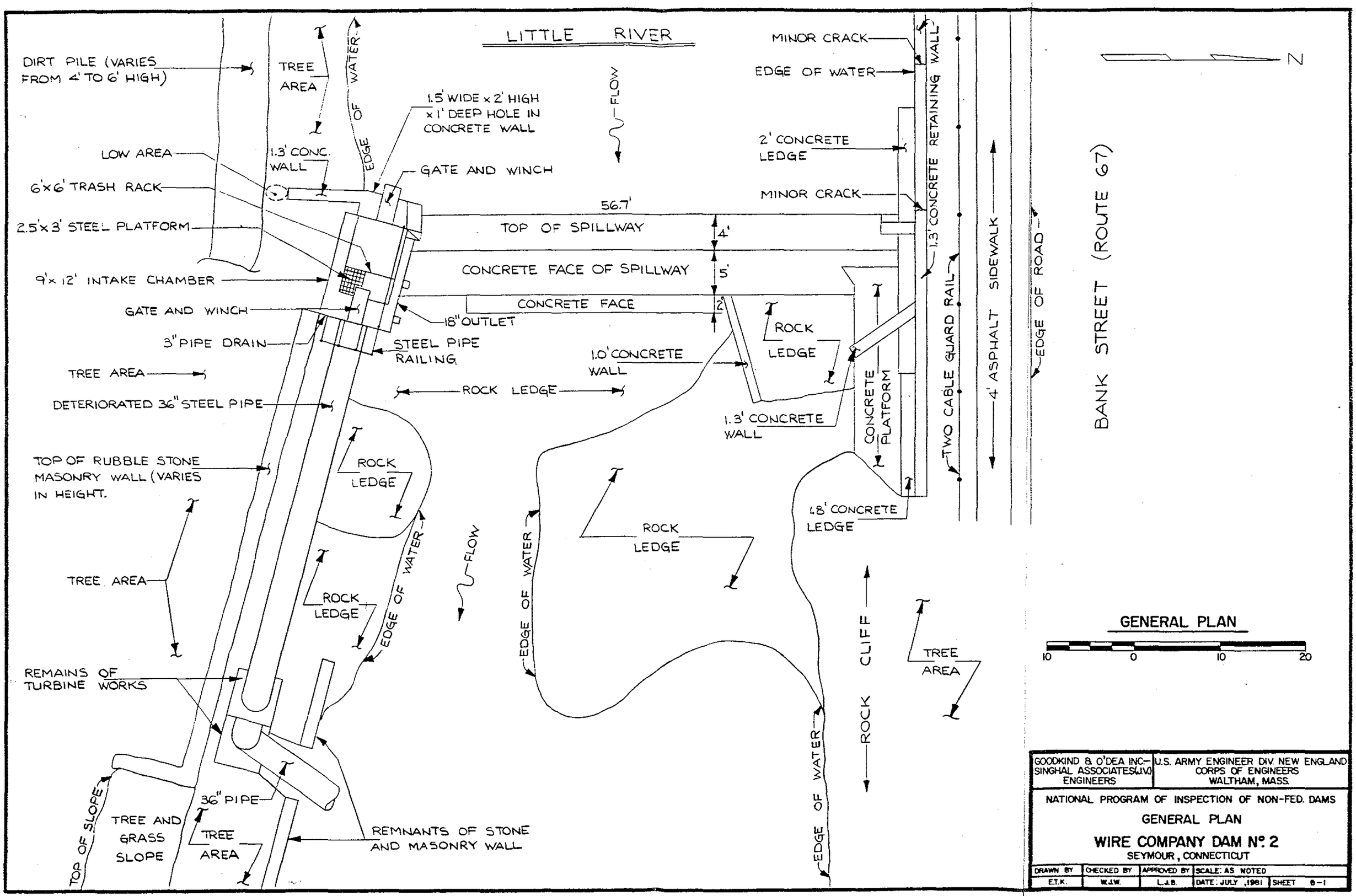
AREA EVALUATED	CONDITION
OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL	36" Iron outlet pipe through deteriorated turbine works into downstream channel
General Condition of Concrete	Concrete at Turbine Works O.K.
Rust or Staining	36" Pipe & Turbine works rusted
Spalling	None
Erosion or cavitation	None
Visible reinforcing	None
Any Seepage of Efflorescence	Seepage from 36" pipe at intake chamber (several gal/min)
Condition at Joints	O.K.
Drain Holes	N/A
Channel	Little River
Loose Rock or Trees Overhanging Channel	Deteriorated rubbled wall overhanging South bank.
Condition of Discharge Channel	Good - Rock ledge Bottom

APPENDIX B

ENGINEERING DATA

ENGINEERING DATA CHECKLIST

ITEM	AVAILABILITY	LOCATION
LOCATION MAP	Available	USGS Map
AS-BUILT DRAWINGS	Not Available	
HYDROLOGIC & HYDRAULIC DATA	Not Available	
SOIL BORINGS	Not Available	
SOIL TESTING	Not Available	
GEOLOGY REPORTS	Not Available	
CONSTRUCTION HISTORY	Not Available	
OPERATION RECORDS	Not Available	
INSPECTION HISTORY	Not Available	
DESIGN REPORT	Not Available	
DESIGN COMPUTATIONS	Not Available	
HYDROLOGIC & HYDRAULIC	Not Available	
DAM STABILITY	Not Available	
SEEPAGE ANALYSIS	Not Available	



GENERAL PLAN

10 0 10 20

GOODKIND & O'DEA INC.–SINGHAL ASSOCIATES (J.V.) ENGINEERS	U.S. ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.

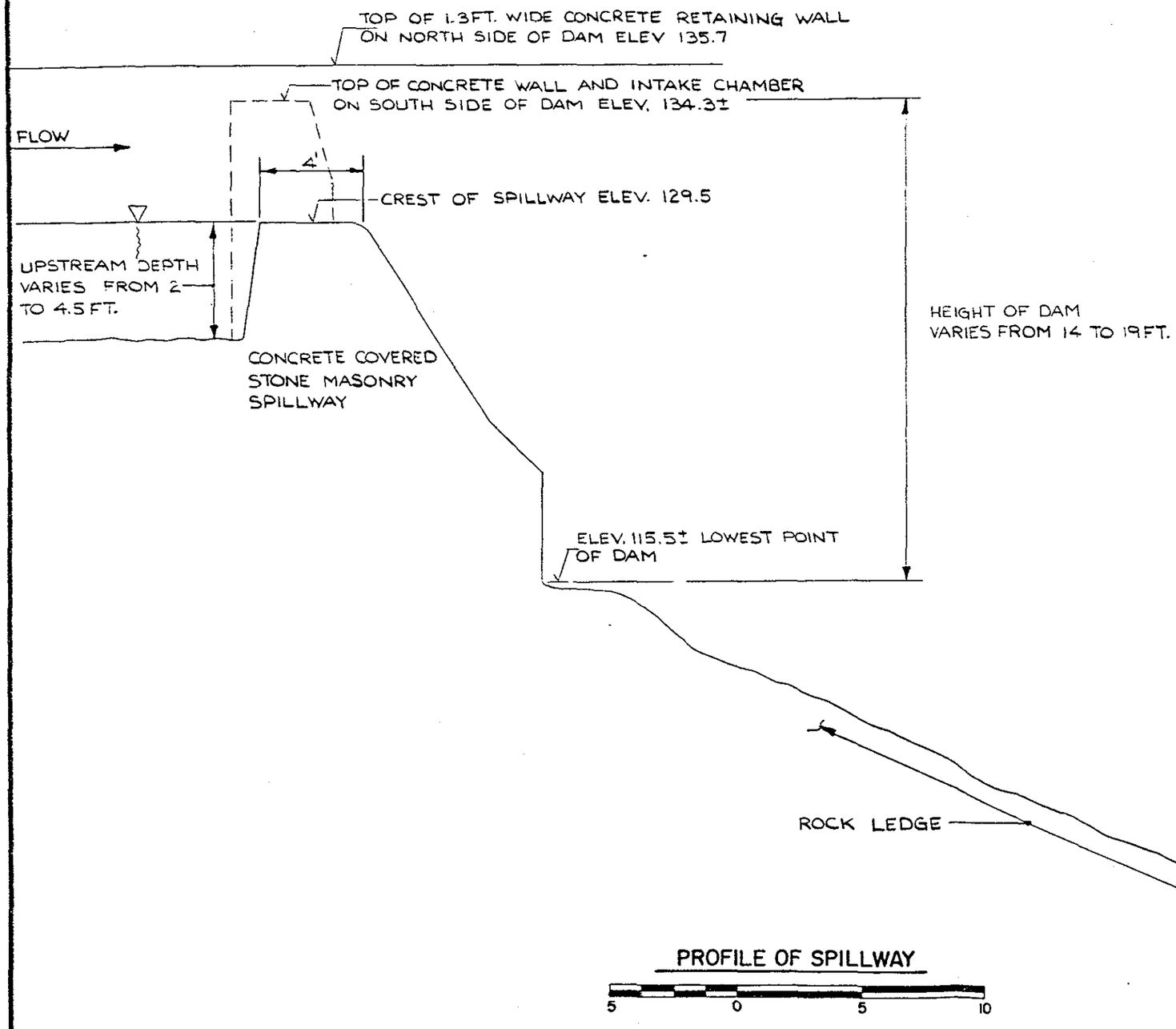
NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

GENERAL PLAN

WIRE COMPANY DAM N° 2

SEYMOUR, CONNECTICUT

DRAWN BY	CHECKED BY	APPROVED BY	SCALE: AS NOTED	
E.T.K.	W.J.W.	L.J.B.	DATE: JULY, 1981	SHEET 8-1



PROFILE OF SPILLWAY

5 0 5 10

NOTE:
ALL ELEVATIONS REFERENCED TO MEAN SEA LEVEL.

NOTE:
WIRE COMPANY DAM #1 IS APPROXIMATELY 200' DOWNSTREAM OF WIRE COMPANY DAM #2

GOODKIND & O'DEA INC.–SINGHAL ASSOCIATES(J.V.) ENGINEERS	U.S. ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

PROFILE OF SPILLWAY

WIRE COMPANY DAM N° 2

SEYMOUR, CONNECTICUT

DRAWN BY	CHECKED BY	APPROVED BY	SCALE: AS NOTED	
E.T.K.	W.J.W.	L.J.B.	DATE: JULY, 1981	SHEET B-2

BIBLIOGRAPHY

1. "Recommended Guildelines for Safety Inspection of Dams", Department of the Army, Office of the Chief Engineers, Washington, D.C. 20314, 1979.

2. Design of Small Dams, Revised Reprint, United States Department of the Interior, Bureau of Reclamation, United States Government Printing Office, Washington, D.C.

3. Soil Survey, Hartford County, Connecticut, United States Department of Agriculture, U.S. Government Printing Office, Washington 25, D.C. 1962

4. Donald M. Gray: Handbook on the Principles of Hydrology, Water Information Center, 1970.

5. Hunter Rouse: Engineering Hydraulics, John Wiley and Sons, New York, 1950.

6. Victor L. Streeter: Fluid Mechanics, McGraw-Hill Book Company, Inc. 1958.

7. S.C.S. National Engineering Handbook, Hydrology Section 4, Soil Conservation Service, U.S. Department of Agriculture, 1972.

APPENDIX C

DETAIL PHOTOGRAPHS

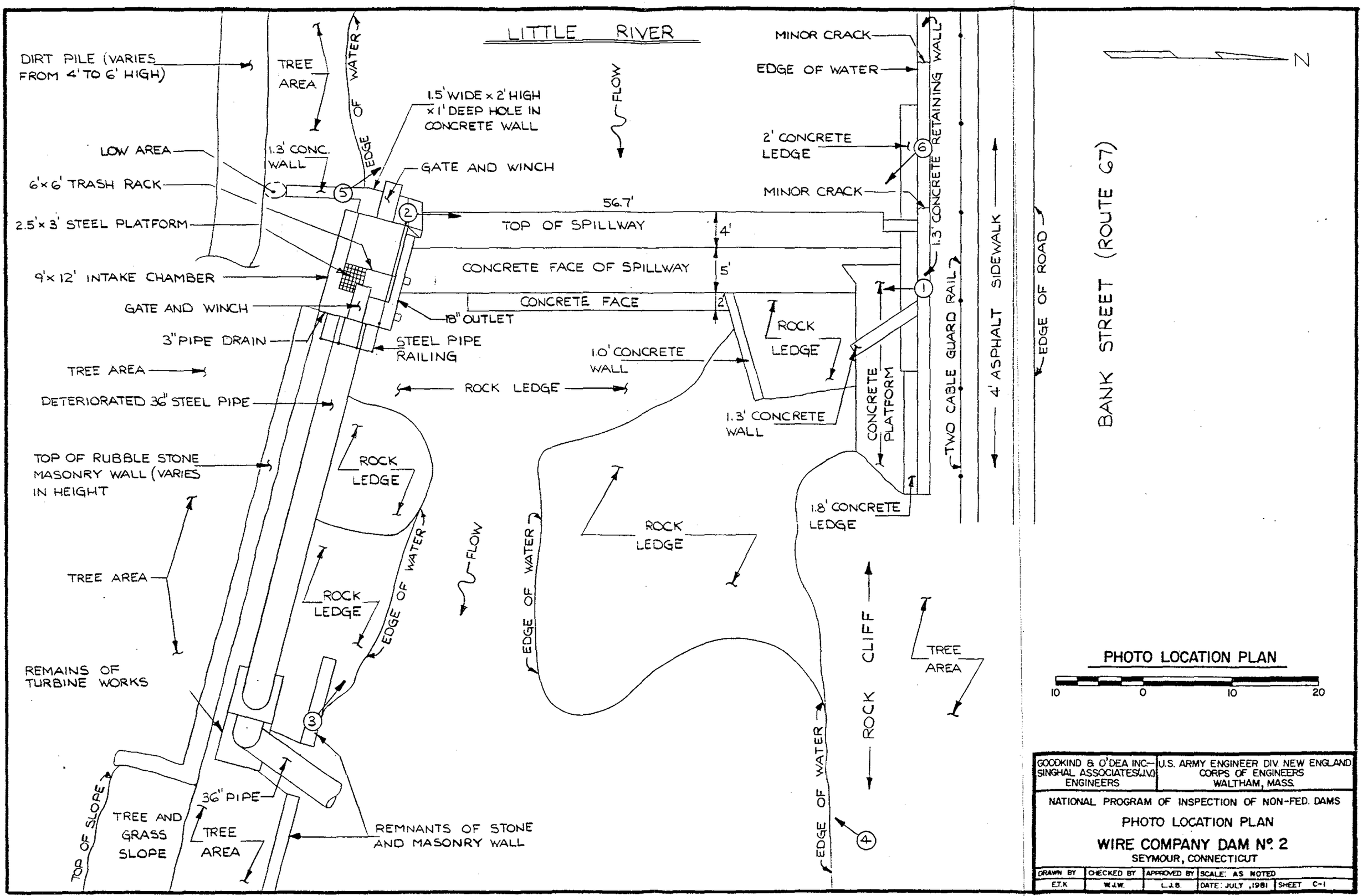


PHOTO LOCATION PLAN

10 0 10 20

GOODKIND & O'DEA INC.—SINGHAL ASSOCIATES (J.V.) ENGINEERS	U.S. ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

PHOTO LOCATION PLAN

WIRE COMPANY DAM Nº. 2

SEYMOUR, CONNECTICUT

DRAWN BY	CHECKED BY	APPROVED BY	SCALE: AS NOTED	
E.T.K.	W.J.W.	L.J.B.	DATE: JULY, 1981	SHEET C-1

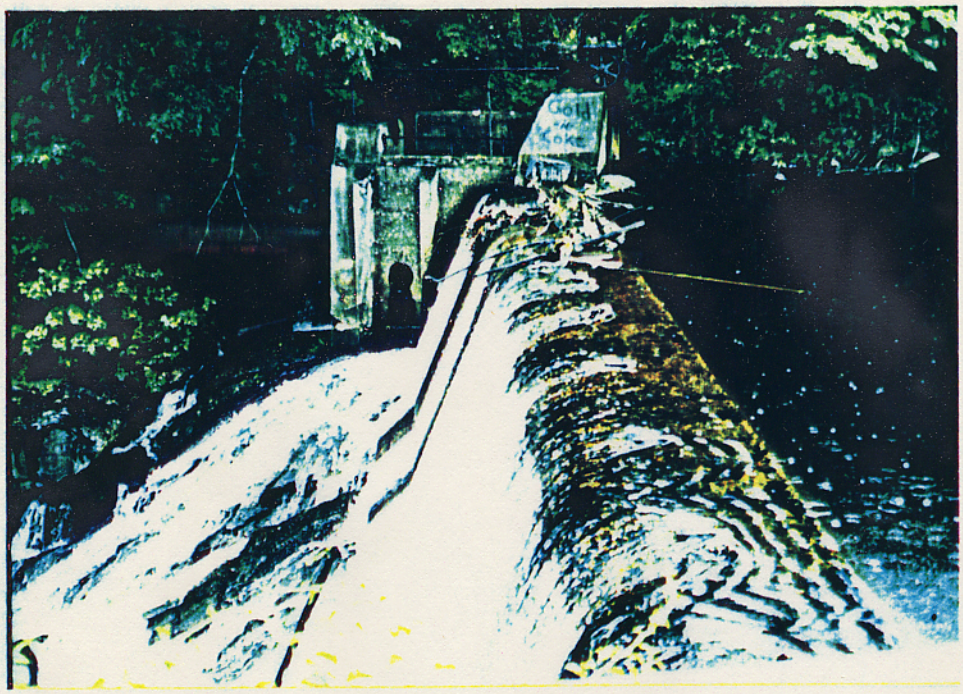


Photo 1 - View across spillway looking south.
Note outlet works.

Photo 2 - Looking north across spillway crest.
Note accumulated debris.

Note: Photos taken
June 2, 1981

Photo 3 - Face of concrete spillway and rock ledge falls.

Photo 4 - View of outlet works located along south side of dam.

Note: Photos taken June 2, 1981

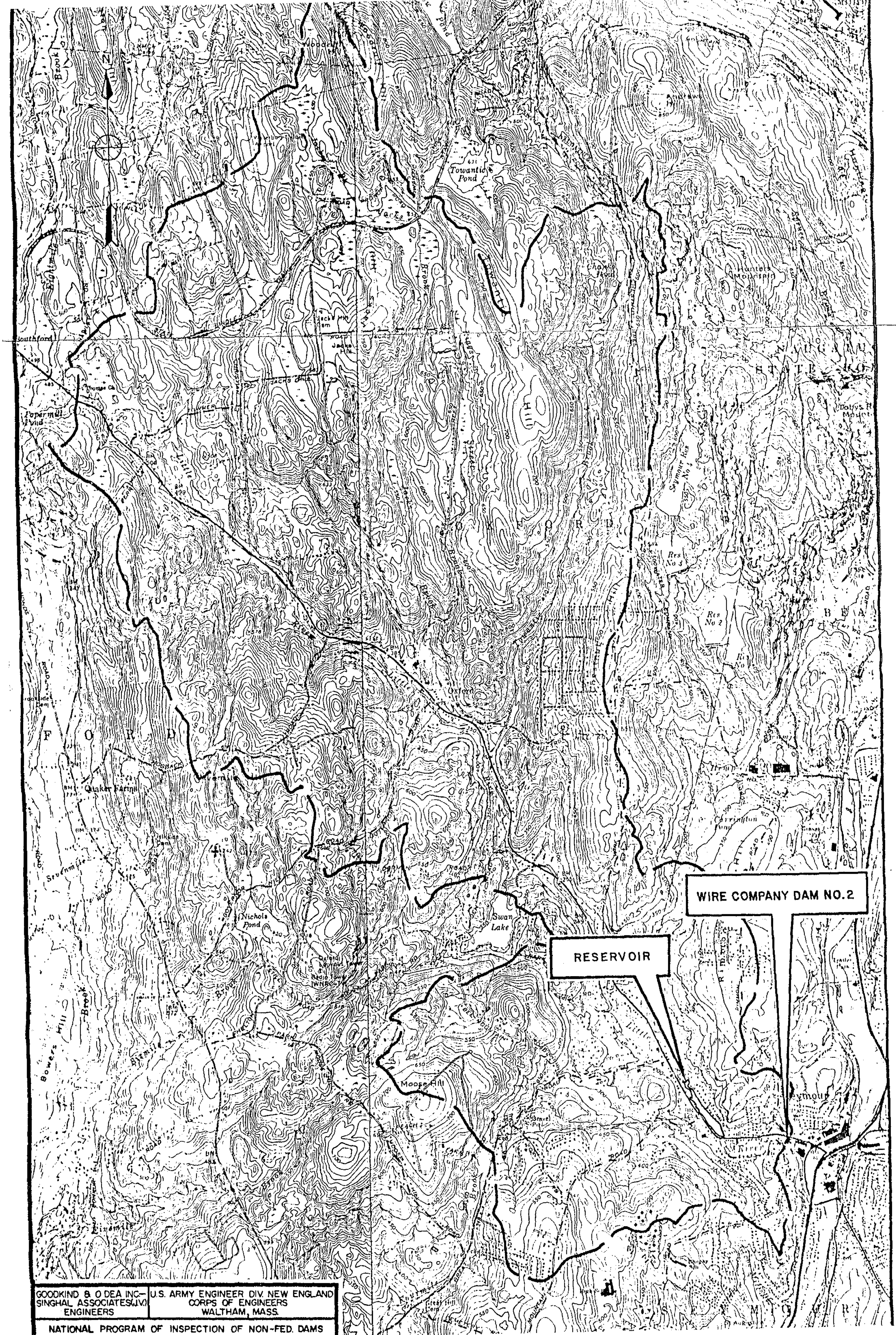
Photo 5 - Upstream area (Little River)

Photo 6 - Downstream channel. Note rubbled foundation wall along the south channel bank.

Note: Photos taken June 2, 1981

APPENDIX D

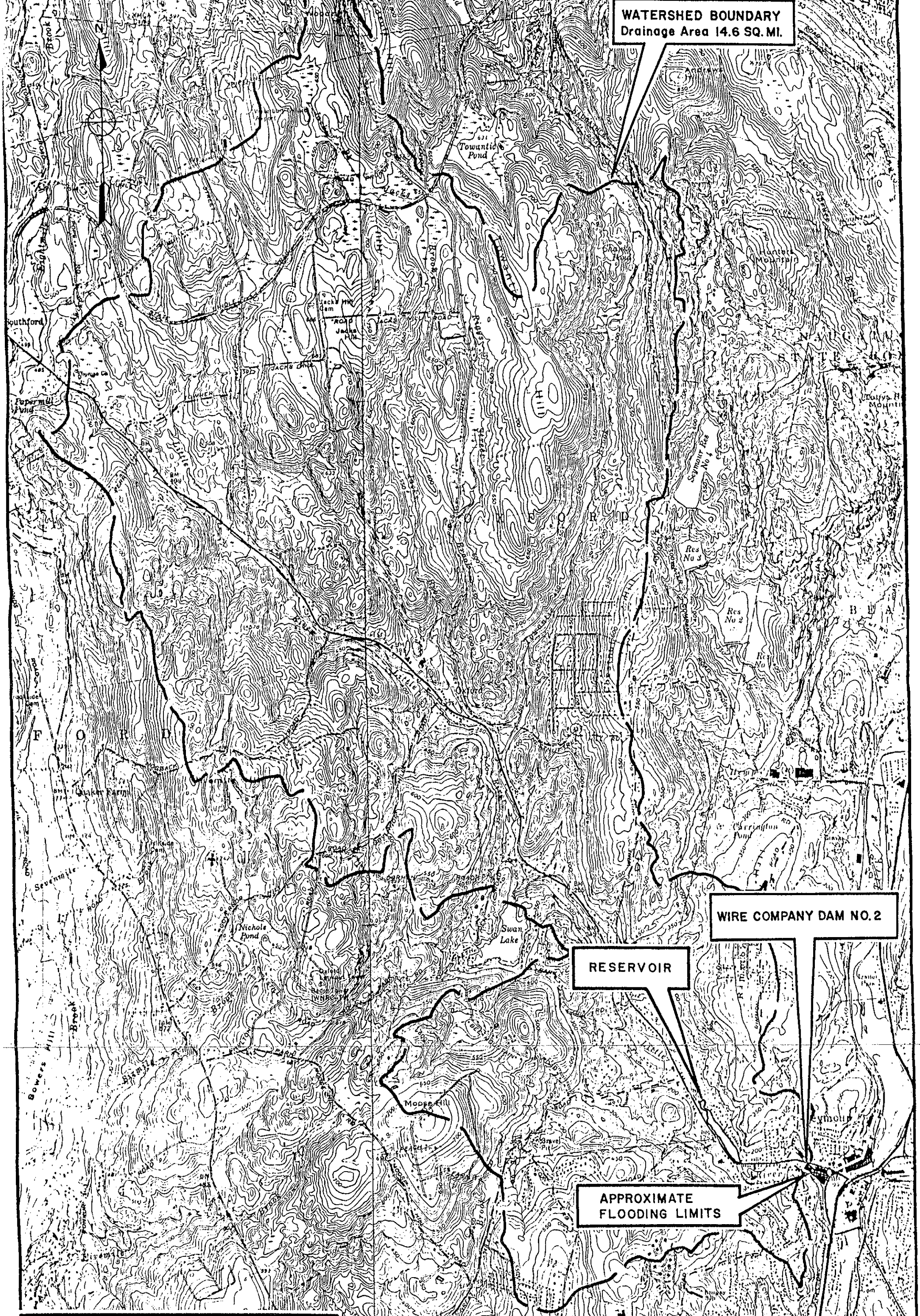
HYDROLOGIC AND HYDRAULIC COMPUTATIONS



GOODKIND & O DEA INC- SINGHAL ASSOCIATES(J.V.) ENGINEERS

U.S. ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS



GOODKIND & O'DEA INC.–SINGHAL ASSOCIATES(J.V.) ENGINEERS	U.S. ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

DRAINAGE AREA MAP

WIRE COMPANY DAM NO. 2

SINGHAL ASSOCIATES
CONSULTING ENGINEERS
(CIVIL, HYDRAULICS, SANITARY)

827 MAPLEDALE ROAD, ORANGE, CT 06477
TEL: (203) 795-6562

Job WIRE CO DAM #2
Sheet Number D-1
Date 6.12.1981
By RS/GS

TEST - FLOOD

DRAINAGE AREA = 14.6 SQ. MILES

THE TERRAIN HAS AN AVERAGE SLOPE OF 2%.
FROM THE CORPS OF ENGINEER'S CHART FOR "MAXIMUM PROBABLE FLOOD PEAK FLOW RATES",

RUNOFF FACTOR = 600 CFS PER SQ. MILE (FLAT & COASTAL)

RUNOFF. = 600 × 14.6 = 8,760 CFS.

ADDING AN OVER FLOW OF 860 CFS FROM SWAN LAKE

P.M.F. = 8760 CFS. + 860 CFS
= 9,620 CFS

SIZE AND HAZARD CLASSIFICATION

MAXIMUM HEIGHT OF DAM = 19'
MAXIMUM IMPOUNDMENT
(UPTO TOP OF DAM) = 34 AC.FT.

SIZE OF THE DAM = SMALL

THE HAZARD POTENTIAL IS 'SIGNIFICANT'. ALTHOUG NO LOSS OF LIFE IS EXPECTED, THE ECONOMIC LOSS MAY BE APPRECIABLE DUE TO THE EXISTENCE OF THE WIRE CO. BUILDINGS ON THE DOWNSTREAM SIDE WHICH WILL BE FLOODED IN CASE OF DAM FAILURE.

AS PER TABLE 3 PAGES D-12, D-13 OF THE "RECOMMENDED GUIDELINES FOR SAFETY INSPECTION OF DAMS",

RECOMMENDED TEST FLOOD = 100 YR TO ½ PMF

ASSUMING ½ PMF VALUE,

THE TEST FLOOD = $(\frac{1}{2} \times 8760) + 860 = 5240$
SAY 5,200 CFS

SINGHAL ASSOCIATES
CONSULTING ENGINEERS
(CIVIL, HYDRAULICS, SANITARY)
827 MAPLEDALE ROAD, ORANGE, CT 06477
TEL: (203) 795-6562

Job WIRE CO. DAM #2
Sheet Number D-2
Date 6.12.1981
By P.S./G.S.

SPILLWAY CAPACITIES

THE SPILLWAY CONSISTS OF THE FOLLOWING:

1- OVERFLOW SPILLWAY 57 FT. LONG. WITH CREST ELEVATION 129.50

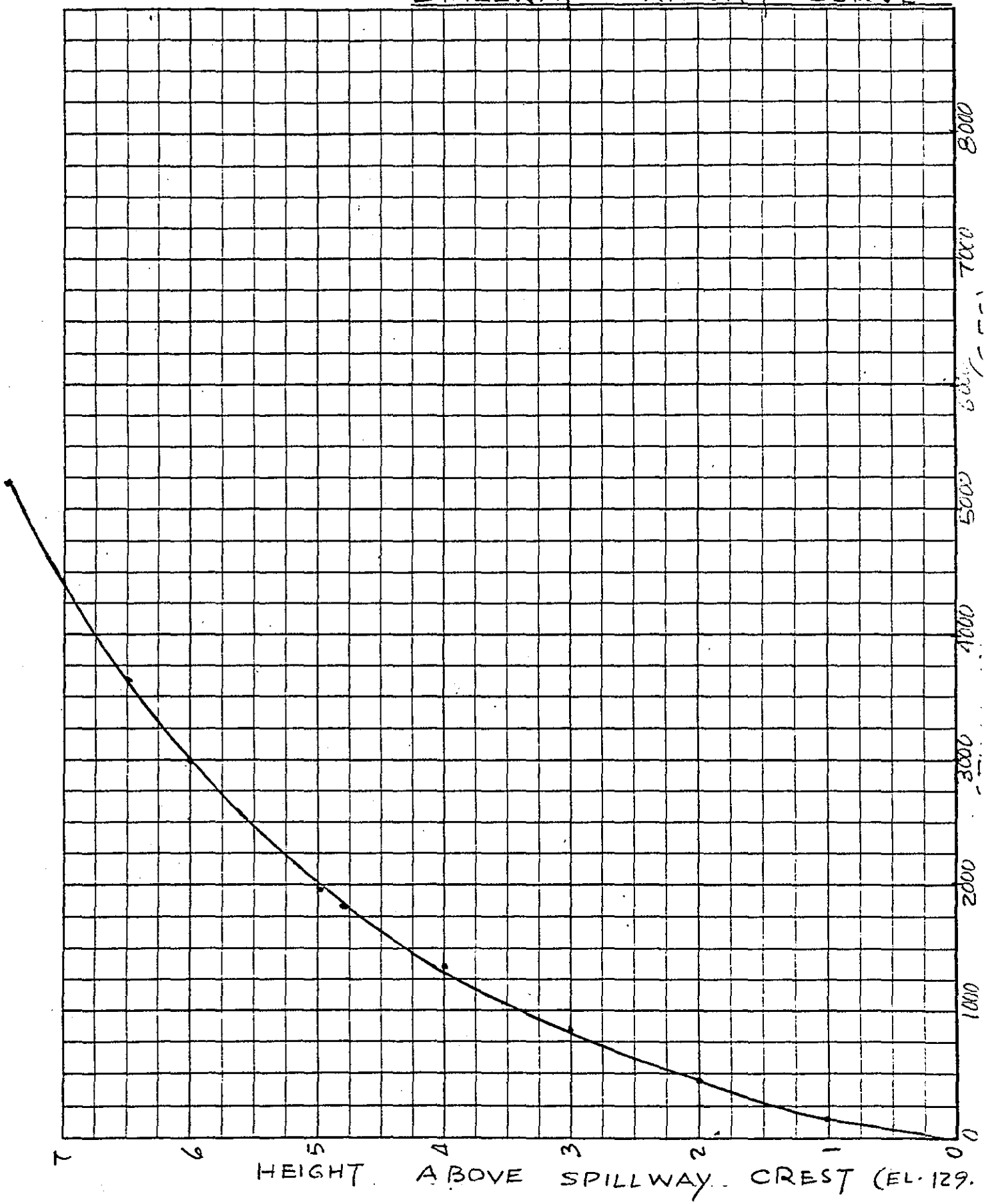
CAPACITIES AT VARIOUS ELEVATIONS ARE TABULATED BELOW:

ELEVATION	CAPACITY - CFS			
	SPILLWAY		OVERFLOW AFTER DAM IS OVERTOPPED $Q=3\times125\times H^{3/2}$	TOTAL
	H (FT)	$Q=3\times57\ H^{3/2}$		
129.50	0	0	0	0
130.50	1	170	0	170
131.50	2	484	0	484
132.50	3	890	0	890
133.50	4	1370	0	1370
134.30	4.8	1800	0	1800
134.50	5	1915	35	1950
135.50	6	2515	493	3008
136.00	6.5	2835	830	3665
137.00	7.5	3512	1684	5,196

SINGHAL ASSOCIATES
CONSULTING ENGINEERS
(CIVIL, HYDRAULICS, SANITARY)
827 MAPLEDALE ROAD, ORANGE, CT 06477
TEL: (203) 795-6562

Job WIRE CO. DAM #2
Sheet Number D-3
Date 6.12.1981
By RS/GS.

SPILLWAY CAPACITY CURVE



SINGHAL ASSOCIATES
CONSULTING ENGINEERS
(CIVIL, HYDRAULICS, SANITARY)

827 MAPLEDALE ROAD, ORANGE, CT 06477
TEL: (203) 795-6562

Job WIRE CO. DAM #2
Sheet Number D-4
Date 7.6.1981
By R.S./G.S.

INFLOW, ROUTED OUTFLOW & ADEQUACY OF SPILLWAY CAPACITY.

TEST FLOOD FLOW = 5,200 CFS.

SPILLWAY CAPACITY UPTO TOP OF DAM (ELEV. 134.3) = 1798 CFS.

THIS IS INADEQUATE AND THE DAM WILL BE OVERTOPPED. IN ORDER TO PASS THE TEST-FLOOD THE WATER LEVEL WILL RISE TO ELEVATION 137.0 WHICH IS 2.7 FT. ABOVE THE CREST OF THE DAM (EL. 134.3 AT THE SOUTH END. THIS DOES NOT TAKE INTO CONSIDERATION, THE SURCHARGE STORAGE EFFECT OF THE RESERVOIR UPSTREAM. THIS IS HOWEVER NEGLIGIBLE AS THE FOLLOWING COMPUTATION WILL INDICATE.

EFFECT OF SURCHARGE STORAGE ON PEAK OUTFLOW

THE LENGTH OF SPILLWAY CREST AT THE RESERVOIR UPSTREAM = 75 FT (APPROX.)

$$Q = 3 L H^{3/2}$$

OR $H^{3/2} = \frac{Q}{3L} = 5200/(3 \times 75) = 23.1$

$H = 8$ FT.

WATER SURFACE AREA = 8.6 ACRES

SURCHARGE STORAGE = $8 \times 8.6 = 69$ AC. FT.

WHICH CORRESPONDS TO $\frac{69 \times 12}{14.6 \times 640} = 0.09"$ OF RUNOFF

$$Q_{p2} = Q_{p1}\left(1 - \frac{0.09}{9.5}\right) = 5200 \times 0.99 = 5150 \text{ CFS}$$

THE STORAGE EFFECT IS MINIMAL AND THE ROUTED OUTFLOW CAN BE ASSUMED AS 5,200 CFS SAME AS THE INFLOW.

SINGHAL ASSOCIATES
CONSULTING ENGINEERS
(CIVIL, HYDRAULICS, SANITARY)

827 MAPLEDALE ROAD, ORANGE, CT 06477
TEL: (203) 795-6562

Job WIRE CO. DAM #2
Sheet Number D-5
Date 7.6.1981
By R.S./G.S.

DAM FAILURE FLOOD FLOW

AS PER CORPS OF ENGINEERS' GUIDELINES:

$$Q_{P_1} = \frac{8}{27} \cdot W_b \cdot \sqrt{g} \cdot y_o^{3/2}$$

WHERE Q_{P_1} = DAM FAILURE PEAK OUTFLOW IN CFS.

W_b = BREACH WIDTH = 40 % OF THE DAM LENGTH AT MID-HEIGHT.

Y_o = HEIGHT FROM STREAMBED TO POOL LEVEL AT FAILURE.

SUBSTITUTING KNOWN VALUES OF W_b AND Y_o AS $0.4 \times 75' = 30$ FT. AND 19 FT. RESPECTIVELY (THE FAILURE ASSUMED WITH POOL LEVEL AT THE TOP OF THE DAM EL. 134.3):

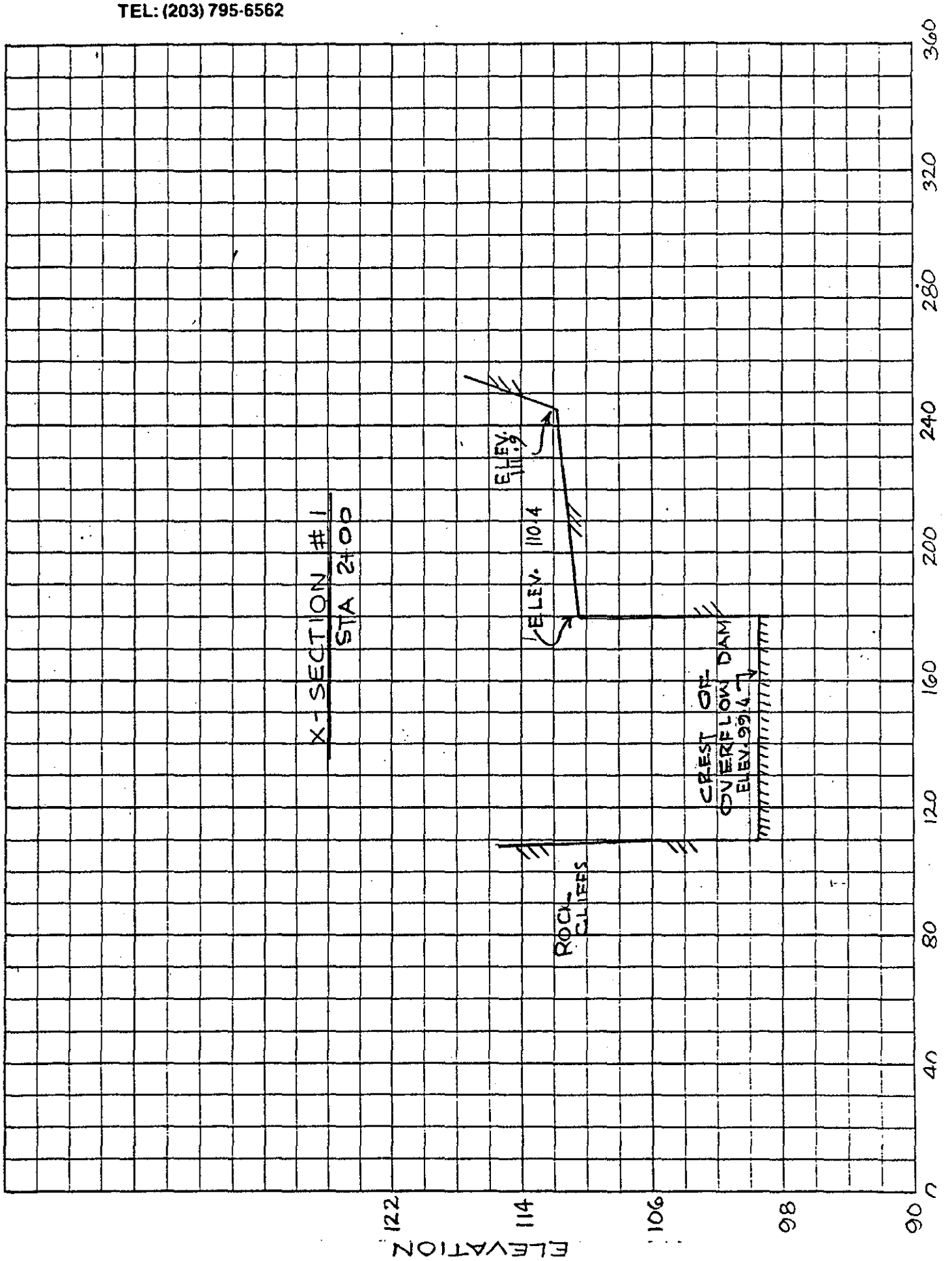
$$Q_{P_1} = \frac{8}{27} \times 30 \times \sqrt{32.2} \times 19^{3/2}$$

$$= 4175 \text{ CFS.}$$

SAY 4200 CFS

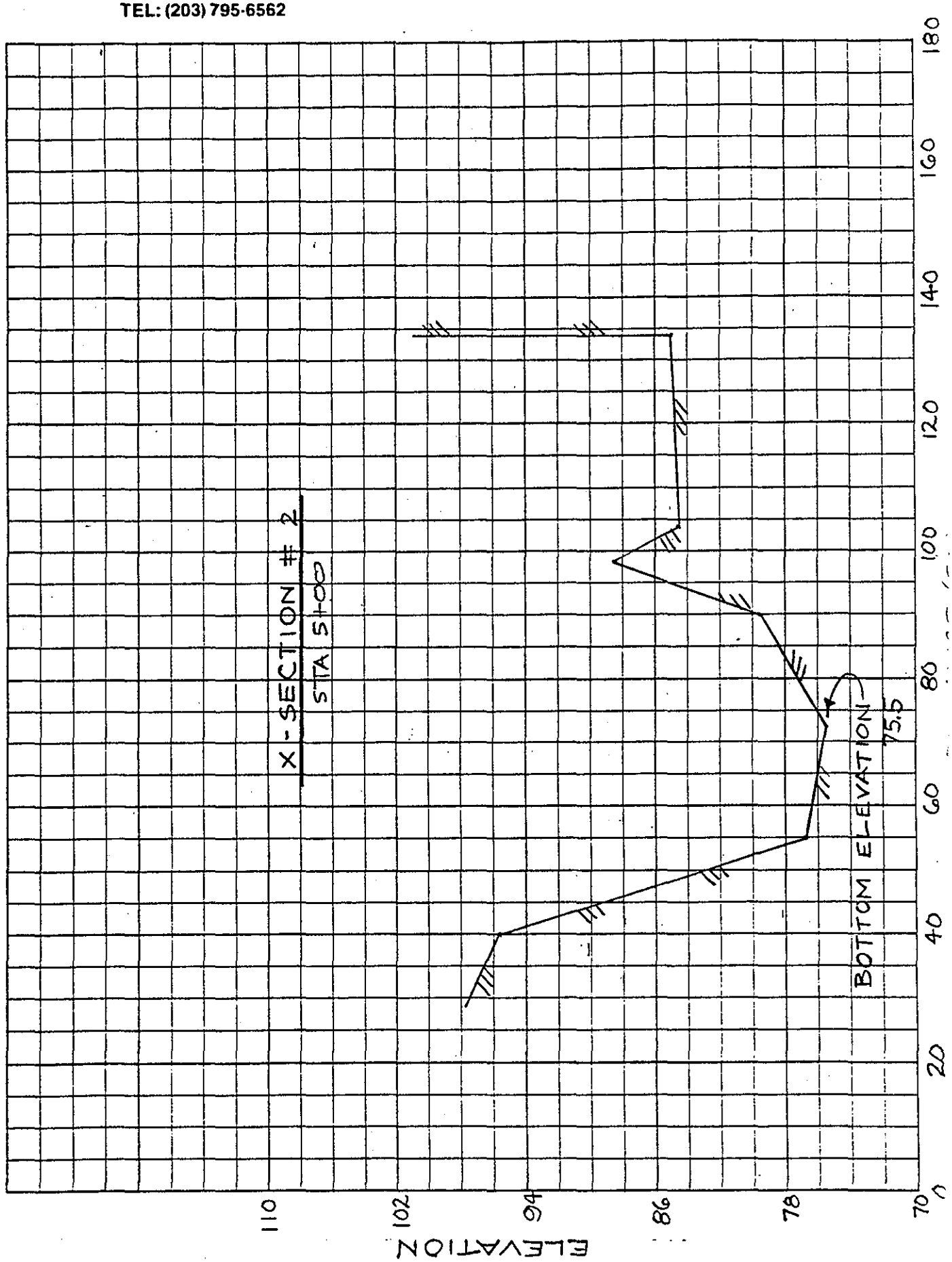
SINGHAL ASSOCIATES
CONSULTING ENGINEERS
(CIVIL, HYDRAULICS, SANITARY)
827 MAPLEDALE ROAD, ORANGE, CT 06477
TEL: (203) 795-6562

Job WIRE COMPANY DAM No. 2
Sheet Number D-6
Date 7-7-1981
By R.S./G.S.



SINGHAL ASSOCIATES
CONSULTING ENGINEERS
(CIVIL, HYDRAULICS, SANITARY)
827 MAPLEDALE ROAD, ORANGE, CT 06477
TEL: (203) 795-6562

Job WIRE COMPANY DAM No. 2
Sheet Number D-7
Date 7-7-1981
By R.S./G.S.



SINGHAL ASSOCIATES
CONSULTING ENGINEERS
(CIVIL, HYDRAULICS, SANITARY)
827 MAPLEDALE ROAD, ORANGE, CT 06477
TEL: (203) 795-6562

Job WIRE COMPANY DAM #1
Sheet Number D-8
Date 7.7.1981
By R.S./G.S.

DAM FAILURE FLOOD ROUTING

X-SECTION #1 STA. 2+0
(DAM 200 FT. DOWNSTREAM).

ELEV.	H (FT)	Q (CFS) $= 3 \times 70 \times H^{3/2}$
99.4	0.0	0.0
102.0	2.6	880
104.0	4.6	2070
106.0	6.6	3,560
108.0	8.6	5300
110.0	10.6	7250
110.4	11.0	7,700

TO PASS DAM BREACH FLOW OF 4,200 CFS.
THE SURCHARGE DEPTH OVER THE LOWER DAM CREST = 7.0'
SURCHARGE STORAGE = $200 \times 70 \times 7 / 43560 = 2.3$ AC.F

CORRESPONDING RUNOFF DEPTH IN INCHES

$$= \frac{2.3 \times 12}{640 \times 14.6} = .003''$$

$$Q_{P_2} = Q_{P_1}\left(1 - \frac{.003}{9.5}\right) = 4200 \times 0.9997 = 4198 \text{ SAY } 4200 \text{ CFS.}$$

DEPTH OF FLOW = 7.0', FLOOD ELEV. = 99.4 + 7.0 = 106.4

PRE-FAILURE FLOW = 5,200 CFS.

$$H = \left(\frac{5200}{3 \times 70}\right)^{2/3} = 8.3'$$

FLOOD ELEVATION = 99.4 + 8.3 = 107.7

NUMBER OF HOUSES FLOODED

BEFORE FAILURE : 0
AFTER FAILURE : 0

SINGHAL ASSOCIATES
CONSULTING ENGINEERS
(CIVIL, HYDRAULICS, SANITARY)
827 MAPLEDALE ROAD, ORANGE, CT 06477
TEL: (203) 795-6562

Job WIRE COMPANY DAM No. 2
Sheet Number D-9
Date 7.7.81
By R.S./G.S.

X-SECTION #2 STA. 5+00

ELEV.	D (FT.)	P_w (FT.)	A (SF.)	$R = A/P_w$ (FT.)	S (FT./FT.)	$V = \frac{1.486}{n} R^{\frac{2}{3}} S^{\frac{1}{2}}$ (FT./SEC.)	Q (C.F.S.)
78.0	2.5	29	47	1.62		9.96	470
80.0	4.5	37	117	3.16		15.55	1820
82.0	6.5	40	197	4.92	.029	20.9	4120
84.0	8.5	44	285	6.47		25.0	7125
86.0	10.5	47	377	8.02		28.9	10900

SINGHAL ASSOCIATES
CONSULTING ENGINEERS
(CIVIL, HYDRAULICS, SANITARY)
827 MAPLEDALE ROAD, ORANGE, CT 06477
TEL: (203) 795-6562

Job WIRE CO. DAM #2
Sheet Number D-10
Date 7.7.1981
By R.S. / G.S.

DAM FAILURE FLOOD ROUTING
X-SEC. #2 STA 5+00

FOR $Q_{p_1} = 4{,}200$ CFS, $H_1 = 6.5'$ AND $A_1 = 197$ S.F
REACH LENGTH = 250'
STORAGE VOLUME = $300 \times 197/43560 = 1.4$ AC.FT.
$= 0.002''$ OF RUNOFF

$$Q_{p_2} = Q_{p_1}\left(1 - \frac{0.002}{9.5}\right) = 4200 \times 0.9998 = 4{,}199 \text{ CFS}$$
SAY 4,200 CFS.

ROUTED FLOW BELOW X-SEC #2 WILL BE
$Q = 4{,}200$ CFS
AND $H = 6.5'$, FLOOD ELEV. $= 75.5 + 6.5 = 82.0$

PRE-FAILURE FLOW = 5,200 CFS
AND $H = 7.2'$, FLOOD ELEV. $= 75.5 + 7.2 = 82.7$

NUMBER OF HOUSES FLOODED:

BEFORE FAILURE: 0
AFTER FAILURE: 0

APPENDIX E

INFORMATION AS CONTAINED IN THE NATIONAL INVENTORY OF DAMS